

CLAIMS

1. A reducing mill including a plurality of stands disposed along a rolling direction line, wherein a pipe or tube is rolled through said plurality of stands along said rolling direction line,

said stands each include n rolls ($n \geq 3$) disposed around said rolling direction line,

said n rolls are disposed shifted by $180^\circ/n$ around said rolling direction line from n rolls included in a preceding stand,

Each of said n rolls included in each of said plurality of stands excluding a last stand has a groove having an arch shape in cross section,

the bottom of said groove having a circular arc shape having a first radius around said rolling direction line in cross section,

the distance between the surface of a roll flange portion positioned between the bottom and the edge of said groove and said rolling direction line is longer than said first radius, and

the distance between the edge of said groove and said rolling direction line is longer than the first radius in the groove of a roll included in said preceding stand.

2. The reducing mill according to claim 1, wherein said roll flange portion has an arch shape in cross section.

3. The reducing mill according to claim 2, wherein in cross section of said groove, a tangent on an end of said bottom matches a tangent on an end of said roll flange portion on the side of said bottom.

4. The reducing mill according to claim 3, wherein said roll flange portion has a circular arc shape having a second radius larger than said first radius in cross section.

5. The reducing mill according to claim 1, wherein said roll flange portion has a straight shape in cross section.

6. The reducing mill according to any one of claims 1 to 5, wherein n equals 3 and the circular arc of said bottom has a central angle of at least 50° .

7. The reducing mill according to any one of claims 1 to 5, wherein n equals 4, and the circular arc of said bottom has a central angle of at least 36° .

8. A roll for use in a reducing mill including a plurality of stands disposed along a rolling direction line, said stands each including n rolls ($n \geq 3$) disposed around said rolling direction line, wherein a pipe or tube is rolled through the plurality of stands along said rolling direction line,

said roll has a groove in an arch shape in cross section,

the bottom of said groove has a circular arc shape having a first radius around said rolling direction line in cross section, and

the distance between the surface of a roll flange portion positioned between the bottom and the edge of said groove and said rolling direction line is longer than said first radius.

9. The roll according to claim 8, wherein said roll flange portion has an arch shape in cross section.

10. The reducing mill according to claim 9, wherein a tangent on an end of said bottom matches a tangent on an end of said roll flange portion on the side of said bottom.

11. The roll according to claim 10, wherein said roll flange portion has a circular arc shape having a second radius larger than said first radius in cross section.

12. The roll according to claim 8, wherein said roll flange portion has a straight shape in cross section.

13. The reducing mill according to any one of claims 8 to 12, wherein n equals 3, and the arc of said bottom has a central angle of at least 50° .

14. The reducing mill according to any one of claims 8 to 13, wherein n equals 4, and the arc of said bottom has a central angle of at least 36° .